

CLAIMS

What is claimed is:

1. A fuel cell system having a cooling fluid flowing therethrough, comprising:
a fuel cell stack in heat transfer communication with said cooling fluid; and
a conduit through which said cooling fluid flows and comprising a first layer of hydrogen-permeable material, wherein hydrogen within said cooling fluid permeates through said first layer of hydrogen-permeable material to reduce a hydrogen content of said cooling fluid.
2. The fuel cell system of claim 1 further comprising a support layer disposed concentric to said first layer of hydrogen-permeable material.
3. The fuel cell system of claim 2 wherein said support layer is breathable to enable passage of said hydrogen to atmosphere.
4. The fuel cell system of claim 2 wherein said support layer includes a mesh through which said hydrogen permeates.
5. The fuel cell system of claim 1 further comprising a second layer of hydrogen-permeable material disposed about said first layer of hydrogen-permeable material.

6. The fuel cell system of claim 5 further comprising a support layer disposed between said first and second layers of hydrogen permeable material.

7. The fuel cell system of claim 1 further comprising a fluid-permeable protective layer disposed about said conduit, protecting said conduit from impact with debris.

8. The fuel cell system of claim 1 further comprising a hydrogen-permeable layer having a partial catalyst coating to induce a reaction between said hydrogen and oxygen to produce water.

9. A method of reducing a hydrogen content of a coolant flowing through a fuel cell system, comprising:

directing said hydrogen-containing coolant through a hydrogen-permeable conduit; and

permeating hydrogen from said coolant through said conduit to reduce said hydrogen content of said coolant.

10. The method of claim 9 further comprising permeating hydrogen through a hydrogen permeable tube of said conduit.

11. The method of claim 10 further comprising permeating hydrogen through a second hydrogen permeable tube of said conduit.

12. The method of claim 9 further comprising permeating hydrogen through a support layer of said conduit.

13. The method of claim 12 further comprising permeating hydrogen through a second support layer of said conduit.

14. The method of claim 9 further comprising flowing oxygen-containing air across an exterior of said conduit.

15. The method of claim 14 further comprising promoting a reaction between said hydrogen and oxygen in said air using a catalyst layer integrated into said conduit to produce water.

16. The method of claim 9 further comprising reinforcing said hydrogen permeable conduit with a support layer to prevent rupturing of said conduit.

17. The method of claim 9 further comprising protecting said conduit from impact with external debris with a protective layer.

18. A conduit of a fuel cell system having a hydrogen-containing fluid flowing therethrough and comprising a first layer of hydrogen-permeable material, wherein hydrogen within said cooling fluid permeates through said first layer of hydrogen-permeable material to reduce a hydrogen content of said cooling fluid.

19. The conduit of claim 18 further comprising a support layer disposed concentric to said first layer of hydrogen-permeable material.

20. The conduit of claim 19 wherein said support layer is breathable to enable passage of said hydrogen to atmosphere.

21. The conduit of claim 19 wherein said support layer includes a mesh through which said hydrogen permeates.

22. The conduit of claim 18 further comprising a second layer of hydrogen-permeable material disposed about said first layer of hydrogen-permeable material.

23. The conduit of claim 22 further comprising a support layer disposed between said first and second layers of hydrogen permeable material.

24. The conduit of claim 18 further comprising a fluid-permeable protective layer disposed about said conduit, protecting said conduit from impact with debris.

25. The conduit of claim 18 further comprising a hydrogen-permeable layer having a partial catalyst coating to induce a reaction between said hydrogen and oxygen to produce water.

26. A conduit of a fuel cell system having a contaminant-containing fluid flowing therethrough and comprising a first layer of contaminant-permeable material, wherein a contaminant within said fluid permeates through said first layer of contaminant-permeable material to reduce a contaminant content of said fluid.

27. The conduit of claim 26 further comprising a support layer disposed concentric to said first layer of contaminant-permeable material.

28. The conduit of claim 27 wherein said support layer is breathable to enable passage of said contaminant to atmosphere.

29. The conduit of claim 27 wherein said support layer includes a mesh through which said contaminant permeates.

30. The conduit of claim 26 further comprising a second layer of contaminant-permeable material disposed about said first layer of contaminant-permeable material.

31. The conduit of claim 30 further comprising a support layer disposed between said first and second layers of contaminant-permeable material.

32. The conduit of claim 26 further comprising a fluid-permeable protective layer disposed about said conduit, protecting said conduit from impact with debris.